

In the Claims

Claims 3, 5 and 17-29 have been cancelled without prejudice.

Claims 1, 7-10 and 14-16 have been amended and Claims 30-35 have been added as follows:

1. (Currently Amended) A grating-coupled waveguide comprising:

a substrate;

a diffraction grating; and

a waveguide film that has a higher index of refraction than said substrate which is a thermoplastic material that has an index of refraction ≤ 1.5 .

2. (Original) The grating-coupled waveguide of Claim 1, wherein said diffraction grating is formed within a top surface of said waveguide film.

Claim 3 (Cancelled)

4. (Original) The grating-coupled waveguide of Claim 1, wherein said diffraction grating also serves the function of said waveguide film.

Claim 5 (Cancelled)

6. (Original) The grating-coupled waveguide of Claim 1, wherein said substrate has an index of refraction in the range of about 1.4-1.5.

7. (Currently Amended) The optical waveguide of Claim 6, A grating-coupled waveguide comprising:

a substrate;

a diffraction grating; and

a waveguide film that has a higher index of refraction than said substrate which has an index of refraction ≤ 1.5 , wherein said substrate is a thermoplastic material including at least one of a polyvinylidene fluoride, polymethylpentene and blends of polyvinylidene fluoride/polymethylmethacrylate.

8. (Currently Amended) The optical waveguide grating-coupled waveguide of Claim 9 4, wherein said substrate has an index of refraction ≤ 1.4 .

9. (Currently Amended) ~~The optical waveguide of Claim 8, A grating-coupled waveguide comprising:~~

a substrate;

a diffraction grating; and

a waveguide film that has a higher index of refraction than said substrate which has an index of refraction ≤ 1.5 , wherein said substrate is a fluoropolymer including fluoroacrylate.

10. (Currently Amended) A grating-coupled waveguide comprising:

a substrate;

a diffraction grating;

a waveguide film formed above said substrate, wherein said waveguide film has a higher index of refraction than said substrate which is a thermoplastic material that has an index of refraction ≤ 1.5 ;

wherein said diffraction grating is either fabricated directly into said substrate or said waveguide film, or located in optical proximity to the said waveguide film, or even forming formed within said waveguide film itself; and

wherein said substrate has a bottom surface that receives a light beam which interfaces with a waveguide formed by said diffraction grating and said waveguide film and diffracts into a fundamental mode which has an evanescent tail that extends further into a sensing region located above said waveguide film ~~than in prior art because said substrate has an index of refraction ≤ 1.5~~ .

11. (Original) The grating-coupled waveguide of Claim 10, wherein a surface sensitivity in the sensing region above said waveguide film is enhanced because said substrate has an index of refraction ≤ 1.5 .

12. (Original) The grating-coupled waveguide of Claim 10, wherein a bulk sensitivity in the sensing region above said waveguide film is enhanced because said substrate has an index of refraction ≤ 1.5 .

13. (Original) The grating-coupled waveguide of Claim 10, wherein said substrate has an index of refraction in the range of about 1.4-1.5.

14. (Currently Amended) ~~The optical waveguide of Claim 13, A grating-coupled waveguide comprising:~~

a substrate;

a diffraction grating;

a waveguide film formed above said substrate, wherein said waveguide film has a higher index of refraction than said substrate which has an index of refraction ≤ 1.5 ;

wherein said diffraction grating is either fabricated directly into said substrate or said waveguide film, or located in optical proximity to the said waveguide film, or formed within said waveguide film itself;

wherein said substrate has a bottom surface that receives a light beam which interfaces with a waveguide formed by said diffraction grating and said waveguide film and diffracts into a fundamental mode which has an evanescent tail that extends into a sensing region located above said waveguide film; and

wherein said substrate is a thermoplastic material including at least one of a polyvinylidene fluoride, polymethylpentene and blends of polyvinylidene fluoride/polymethylmethacrylate.

15. (Currently Amended) ~~The optical waveguide grating-coupled waveguide of Claim 16-10, wherein said substrate has an index of refraction ≤ 1.4 .~~

16. (Currently Amended) ~~The optical waveguide of Claim 15, A grating-coupled waveguide comprising:~~

a substrate;

a diffraction grating;

a waveguide film formed above said substrate, wherein said waveguide film has a higher index of refraction than said substrate which has an index of refraction ≤ 1.5 ;

wherein said diffraction grating is either fabricated directly into said substrate or said waveguide film, or located in optical proximity to the said waveguide film, or formed within said waveguide film itself;

wherein said substrate has a bottom surface that receives a light beam which interfaces with a waveguide formed by said diffraction grating and said waveguide film and diffracts into a fundamental mode which has an evanescent tail that extends into a sensing region located above said waveguide film; and

wherein said substrate is a fluoropolymer including fluoroacrylate.

Claims 17-29 (Cancelled)

30. (New) The grating-coupled waveguide of Claim 1, wherein said thermoplastic material is a polyvinylidene fluoride.

31. (New) The grating-coupled waveguide of Claim 1, wherein said thermoplastic material is a polymethylpentene.

32. (New) The grating-coupled waveguide of Claim 1, wherein said thermoplastic material is a polymethylpentene.

33. (New) The grating-coupled waveguide of Claim 1, wherein said thermoplastic material is a blend of polyvinylidene fluoride/polymethylmethacrylate.

34. (New) A grating-coupled waveguide comprising:
a substrate;
a diffraction grating; and
a waveguide film that has a higher index of refraction than said substrate which is a fluoropolymer that
has an index of refraction ≤ 1.5 .

35. (New) The grating-coupled waveguide of Claim 34, wherein said fluoropolymer is a fluoroacrylate.